DOCUMENT RESUME

ED 340 518 PS 020 272

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TITLE The Project Approach.
PUB DATE Feb 92
NOTE 27p.
PUB TYPE Guides - Classroom Use - Teaching Guides (For Teacher) (052) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Curriculum Design; Early Childhood Education; *Educational Principles; *Educational Theories; Experiential Learning; Instructional Innovation; Integrated Curriculum; Learning Activities; Skill Development; *Student Projects; Teacher Role; *Teaching Methods; *Thematic Approach
IDENTIFIERS *Project Approach (Katz and Chard)

ABSTRACT

This document proposes the project approach as one element of early childhood education that can function in a complementary relationship to other aspects of the early childhood curriculum. The term "project" is defined as an extended investigation of a topic that is of interest to participating children and judged worthy of attention by their teachers. Projects involve the application of a variety of intellectual, academic, and social skills and competencies. The project approach builds self-confidence, encourages creativity and other dispositions, and offers opportunities for children and parents to work closely together in support of the school program. The theoretical rationale for the project approach is based both on a specific view of the main goals of education and on a developmental approach to implementing those goals. The goals are: (1) the construction and acquisition of worthwhile knowledge; (2) the development of a wide variety of basic intellectual and social skills; (3) the strengthening of desirable dispositions; and (4) the engendering of positive feelings in children about themselves as learners and as participants in group endeavors. Each of these goals is defined, and the principles of practice they imply are then discussed in terms of what is understood about young children's development and learning. Guidelines for implementing project work are provided and a model of a specific project is presented. (SH)

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The Project Approach

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February, 1992

In press: Approaches to Early Childhood Education, 2nd Edition. (Eds.) James E. Johnson and J. Roopnarine. Merill Publishing Co.

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The Project Approach

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What is the Project Approach?

Project work is not new to early childhood education. It first gained popularity in the U. S, when advocated and implemented by Dewey and Kilpatrick (Katz & Chard, 1989) It was also known as the "project method" in the 1920s. Under the assumption that "children learn best when their interest is fully engaged and centered" (Young-Bruehl, 1988; p. 179), the project method was used in a school founded by Anna Freud in Vienna in the 1920's and influenced by Dewey's ideas

> "The whole school," [Erik] Erikson later recalled, "would for a time become, for example, the world of the Eskimos. All subjects were then related to Eskimo life - geography, history, science, math and, of course reading and writing. This called for an ingenious combination of playful new experience, careful experiment and free discussion, while it provided a sense of contextuality for all the details provided."(Young-Bruehl, 1988; p. 179.)

In more recent times, project work was a central part of infant education in Britain during the Plowden Years, and of "open education" in the U. S. in the 1960s and early 1970s.

We refer to the practices described below as the project "approach" rather than "method" or "model" to indicate that we see it as one important element of an early childhood curriculum. When incorporated as *part* of the program for children from about three to eight years old project work functions in a complementary relationship to other aspects of the early childhood curriculum, rather than as a total teaching method or model, and thus does not require the abandonment of all their other practices that support children's learning.

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Our major premise is that the inclusion of project work offers a variety of potential benefits for young children because it takes into account what has been learned in the last two decades about the nature of development and learning in the early years. Furthermore, it serves the major goal of engaging children's minds, including their aesthetic and moral sensibilities and all other aspects of their intellectual lives (Katz & Chard, 1989). We begin with a definition of project work, and then support the premise with a summary of the theoretical rationale for its inclusion in the curriculum, a fuller discussion of which can be found in Katz and Chard (1989), and Katz (1991). This is followed by a brief description of what is involved in implementing the approach, and an example of a project.

What is a project?

A project is an extended study of a topic usually undertaken by a group of children, sometimes by a whole class, and occasionally by an individual child. The study is an investigation into various aspects of a topic that is of interest to the participating children and judged worthy of their attention by their teachers.

The study undertaken in a project also involves the application of a variety of intellectual, academic and social skills and competences. Depending on the range of skills already available to the participating children, the work should include writing, measurement, drawing, painting, model-making, reading, creating stories, dramatic and fine arts, and so forth. A project ideally should also involve the acquisition of knowledge and concepts in a variety of domains such as the sciences, social studies, literature, and all the arts.

Among the activities usually included in project work are: collecting information through direct observations, interviews of relevant experts, experiments related to sub-topics of interest, collections of artifacts, and the

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preparation of visual and verbal reports of the findings. The The children are able to investigate, record, and report their finding because they are actively involved in studying real phenomena in their own environments.

Themes, Units and Projects

Many educators use the terms theme, unit or project interchangeable. While both themes and units have a respected place in a curriculum for young children, we find it useful to make distinctions between themes, units and projects.

A theme is usually denoted by a term like "autumn," community helpers, The Pilgrims, or a letter of the alphabet, (e.g. the letter M). The title of a theme tends to be broad and vague and typically does not indicate the direction the work will take, or what the children will know when their work is completed. Because we define projects as investigations, we suggest that the title of a project should indicate the direction of the research effort, e.g. "How houses are built" or "Who measures what in our town?" rather than "Houses" or "Measurement."

Themes based on an alphabetical "letter of the week" fail to take advantage of the general human tendency - especially in young children - to think and learn via narratives (Bruner, 1986). Furthermore, such themes the activities focus on a string of items or events that have in common only the initial letter in their spelling; such arbitrary relationships among the elements studied are unlikely to foster a growing sense of understanding of a multifaceted phenomenon. For example, if the theme is the letter "M" the children could be encouraged to draw pictures, read, create or act out stories about a market, a mouse, the moon, a motor, and so forth. Logical, sequential or cause-effect relationships among the four items cannot be uncovered

through active investigation, discussion, interviews of experts, looking things up and other typical project activities.

Units, on the other hand, typically consist of a sequence of prespecified lessons on particular topics like "The Pilgrims," or "Hawaii." In such units the children rarely influence the topics or sub-topics explored, or determine the questions to be answered, or the activities undertaken. Nor are they usually given responsibility for carrying out the prespecified tasks, reporting and displaying their findings, as they would in a project. Very often units are repeated annually using the same sets of activities and materials and having little or no input from the participating children. However, such units can be important and valuable ways to treat mandatory topics.

While the topics in both themes and units may be important, and the extent and depth of learning achieved very worthwhile, projects related to theme and unit topics could be developed from which the benefits inherent in project work could be more fully realized.

Projects, as indicated above, are investigations of real topics in which the participating children actively negotiate with the teacher the questions to be answered, the experiments to be conducted, and all other features of the effort. So for example, in a project called "Water in our Homes" the children can be involved in determining the data to be collected such as where the water comes from, how it is treated, stored and pumped to the building their home is in, where it enters and leaves the home, its uses, quantities required for each use, its properties at different temperatures, the permeability of materials for roofing, clothing, etc. and how the findings are to be reported and displayed. The children are encouraged to identify sub-topics of special interest to them, and select the particular types of tasks they will take responsibility for and the level of difficulty they will engage in. In addition to the value of

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the new knowledge acquired, and the skills applied, the feelings of mastery resulting from such sustained effort can lay the foundation for a life-long disposition to reach for in-depth understanding of worthwhile topics.

Project work and other parts of the curriculum

The project approach assumes that project work is the informal part of the curriculum that complements and supports its more formal elements such as systematic instruction, especially for children in the early primary grades. Systematic instruction refers to formal teaching of individuals or small groups of children who require adult assistance with learning the specific skills and sub-skills involved in the mastery of literacy and numeracy.

Project work and systematic instruction can be seen as complementary in several ways. First, systematic instruction aids children with the acquisition of basic skills, while project work gives them opportunity to apply such skills in meaningful contexts. Second, in systematic instruction the teacher addresses children's deficiencies, while project work capitalizes on their proficiencies. Third, systematic instruction means the teacher directs the instructional sequences, and specifies the tasks to be undertaken on the basis of his or her expertise in how the skills are best learned, whereas in project work children make their own choices and decisions about what tasks to undertake and select the level of difficulty most comfortable for them. Fourth, during systematic instruction learners are in a passive and receptive posture; in project work they are actively engaged in investigation and applying knowledge and skills, making decisions and choices on all aspects of the work.

Fifth, while intrinsic motivation keeps children engaged in project work, in systematic instruction the teacher takes

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advantage of children's desire to please her, and to meet her expectations. Our hypothesis is that when children have extensive experience of project work, the utility and relevance of basic literacy and numeracy skills become self-evident thereby strengthening their receptivity to the teacher's help in mastering the skills through systematic instruction.

In project work the teacher's role is more consultative than instructional. The teacher is available to the children for consultation at all times, and facilitates the work by maintaining a productive working environment through supervision and monitoring the children's progress. The teacher's observation of the children at work provides cues concerning the kinds of instructional activities that individual or groups of children need and are ready for.

In sum, we suggest as a general principle of practice that young children's development and learning are best served when they have daily opportunity to undertake projects on worthwhile topics **and** when systematic instruction in basic skills is also available for those who cannot achieve mastery without adult help. Teachers are encouraged to balance the two important provisions for learning in the early years, and to avoid the tendency to offer one at the expense of the other.

Theoretical Rationale for the Project Approach

The inclusion of project work in the early childhood curriculum is based partly on our conception of the goals of education, and partly on our view of a developmental approach to implementing those goals. We begin by defining the goals, and follow with the principles of practice implied by the goals and our understanding of young children's development and learning. A fuller discussion of these points can be found in Katz & Chard (1989).

Four Types of Learning Goals

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We suggest that at every level of education four types of learning goals must be addressed: knowledge, skills, dispositions, and feelings. At the early childhood level they can be defined as follows:

1. KNOWLEDGE during the preschool and early primary school period can be broadly defined as ideas, concepts, schemas, scripts of events, facts, information, stories, myths, songs, and other such contents of mind that come under the heading of what is to be constructed and learned. The three Piagetian categories of knowledge - social, physical and logico-mathematical - are often used in discussions of the knowledge goals in the early childhood education (Williams and Kamii, 1986).

2. SKILLS are defined as small, discrete and relatively brief units of behavior or actions that are relatively easily observed or inferred from behavior, (e.g. cutting, drawing, counting a group of objects, making friends and solving problems)

3.DISPOSITIONS are broadly defined as relatively enduring "habits of mind," or characteristic ways of responding to experience across types of situations,(e.g. persistence at tasks, curiosity, generosity or avarice, the disposition to read, or to solve problems). Unlike an item of knowledge or a skill, a disposition is not an end state to be mastered once and for all. It is a trend or consistent pattern of behavior and its possession is established only by its repeated manifestation.

4.FEELINGS are subjective emotional or affective states, e.g. feelings of belonging, self-esteem, confidence, adequacy and inadequacy, of competence and incompetence, and so forth. Feelings about significant phenomena may vary from being transitory to enduring, intense to weak or ambivalent. In early childhood education attitudes and values can also be included in this category (See Katz, 1991).

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The inclusion of project work in the curriculum helps to ensure that the construction and acquisition of knowledge and the mastery of skills can occur in such a way that the **dispositions** to use them are also strengthened. In addition, our experience is that children's involvement in their project work is typically accompanied by **feelings** of self-confidence, satisfaction and, often of pleasure and enthusiasm. Our hypothesis is that if knowledge and skills are acquired in meaningful contexts with ample opportunity to apply them, then the dispositions to deepen the knowledge and use the skills will be strengthened; conversely without such meaningful application, those dispositions will be weakened. In principle, then, the incorporation of project work in the curriculum helps to ensure that all four categories of learning goals are addressed equally and simultaneously.

Principles of Practice and the Learning Goals

Learning in the four goal categories - knowledge, skills, dispositions, and feelings - is facilitated in different ways. In the case of knowledge and skills, learning can be aided by active research and study, by appropriate instruction, and many other processes. However, dispositions and feelings cannot be learned from study, from direct or systematic instruction. Dispositions appear to be acquired from models, to be strengthened by being manifested and appreciated, or weakened when not sufficiently manifested, acknowledged, or effective.

Feelings related to education are likely to be learned as by-products of experience, and not from instruction. Both dispositions and feelings can be thought of as incidental learnings in that they are incidental to the processes by which knowledge is constructed and skills are acquired. However, to label feelings as incidental is not to belittle them, or to devalue the role of the teacher or the curriculum

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in their development; rather it is to emphasize that feelings cannot be taught didactically. Children cannot be instructed in what feelings to have!

Principles related to the acquisition of knowledge and skills. Recent insights into children's development suggest that, in principle, the younger the child, the more readily knowledge is constructed or acquired through active and interactive processes. Conversely, with increasing age children become more able to profit from reactive, passive and receptive instructional processes. This developmental principle suggests that, in practice, young children best construct knowledge from their own first-hand, direct experiences and from interaction with primary sources of knowledge.

The interactive experiences from which knowledge can be constructed and acquired must have content. We suggest that, in principle, the content of interaction should be related to matters of actual or potential interest to the children served by the curriculum. However, because not all of children's interests are equally deserving of attention, and because adults can help children acquire new interests, some selection of what content is most worthy of attention is required. We suggest that the interests to be strengthened in young children are those likely to extend, deepen and improve understandings of their own environments and experiences.

We suggest furthermore that, in principle, the younger the learner, the more integrated the curriculum should be; conversely, as children increase in age and experience their capacities to profit from subject- or discipline-based study

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increases. Young children do not differentiate their ideas, thoughts and interests into categories like science, language, and mathematics. They are more likely to gain knowledge and understanding when the value of applying scientific, linguistic, mathematical and other discipline-related concepts can be appreciated in the process of investigation and interesting topic.

Skills can be acquired and strengthened through a variety of processes: viz. observation, imitation, trial and error, coaching, and instruction, and can be improved with optimum drill and practice. In principle, the younger the child, the more likely skills can be acquired and strengthened by their application in meaningful contexts (Brown, et al. 1989). With increasing age children grasp more fully the relationship between skillfulness and drill and more easily accept the practice and exercise of disembedded or decontextualized skills - even if they do so reluctantly.

We suggest that, in principle, the younger the children, the more important it is that what they learn about (knowledge) and learn to do (skills) has more horizontal than vertical relevance. Vertical relevance refers to learning in preparation for the next rather than the current school experience. It is a type of 'education for the next life;' the content of the curriculum is justified on the basis of what will be required of the children in a future situation rather what would be of meaning in the present. Horizontal relevance means that the children's learning is applicable and meaningful on the same day, on the way home, and in their contemporary lives inside and outside of the educational setting. With increasing age and experience children become more able to construct knowledge and acquire skills with little immediate significance or applicability.

Social Competence.

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Contemporary developmental research suggests that the first six or seven years of development are a critical period in achieving social competence, and that failure to do so can have long term negative consequences (Parker & Asher, 1987; Katz, & McClellan, 1991). In principle, a curriculum for young children must provide frequent activities in which cooperation and coordination of effort among small groups of children is functional and consequential.

Strengthening desirable dispositions

Parents, teachers and school officials invariably include dispositions in their lists of desirable outcomes of education. Among them are: having the desire to learn, being cooperative, creativity, eagerness to approach and solve problems, and many others. Such goals reflect the implicit assumption is that mastery of knowledge and skills must be accompanied by robust dispositions to employ them.

As suggested earlier, dispositions cannot be taught directly. We suggest that, in principle, if dispositions are to be strengthened, ample opportunity for their enactment must be available. For example, the disposition to be problem-solvers can only be strengthened if children have real and meaningful problems to solve in the course of their daily activities. The findings of the research in this area suggest that, in principle, a curriculum that emphasizes child-initiated learning tasks is more likely to strengthen dispositions toward mastery, effort and challenge-seeking.

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Feelings related to school experiences

Like dispositions, feelings cannot be taught directly; they are experienced and strengthened or weakened in the context of the interactions and activities that give rise to them. However, when a curriculum is focused on a narrow range of academic tasks (e.g. workbooks, lessons in phonics, etc.), it is likely that a substantial proportion of the learners will be unable work effectively. Indeed, there is some evidence to suggest that when a single instructional approach is employed with any group of children that is diverse in background, ability and development, about one third is likely to feel left out and to develop feelings of incompetence or inadequacy. The inclusion of project work increases the variety of types of tasks and levels of difficulty available such that all members of the class are likely to be able to find meaningful work that can enhance feelings of competence, belonging and contributing to the group effort.

In sum, it is our view that the incorporation of project work into the curriculum of early childhood education addresses all four categories of learning goals, and makes possible the principles of practice derived from current knowledge of young children's learning.

Implementing Project Work

As defined above, a project is an extended study of a topic typically undertaken by a small group of children within a class, but sometimes by an individual or the whole class. It is a good idea for the teacher to propose possible project topics until children are experienced in project work. Based on knowledge of the children, the teacher can nominate topics of potential interest, and can make a selection based on the discussion that follows.

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Selecting a topic

The selection of a topic for a project is an important first step that can contribute substantially to its success. The following points are suggested as guidelines, especially if project work is new to the teacher or the children. With experience teachers and their pupils not only find selecting a good topic easier, but they can also risk starting a project that does not flourish, and learning something from that experience!

1. The topic is related to the children's own everyday, first-hand experiences. If the children have personal direct and first hand/experience of the topic they will more easily be able to generate questions to answer. Sometimes only a few of the children have direct experience of the topic. In such cases, those children can serve as expert resource persons for the work undertaken.

   If all the children have little or no direct experience of the topic they will be very dependent on the teacher for information and will not readily be able contribute ideas and suggestions from their own observations and experience.

2. The topic is one that is more suitable for for investigating and exploring **in** school than **out** of school. Many topics can be studied at home or by a child on his/her own. But some topics would be difficult to pursue in depth on one's own or at home, e.g. the local peanut processing plant, the water works of the town, etc.; these topics require organized visits and specialized reading materials.

3. The topic involves or allows the integration of a range of subjects/disciplines. A project on the neighborhood supermarket can include all the basic skills in language, literacy, and numeracy, such as writing, reading and measurement, as well as drawing, painting, model-building, history, mapping, science, social studies, literature, music, etc.

4. The topic involves the study of real objects rather than abstract concepts **as starting points.** Real objects or actual observations of real events rather

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than abstracts concepts should serve as starting points. A project may start with a real phenomenon (e.g. the angle the sunshine enters the classroom over a period of several weeks). Once the children realize how the angle gradually changes they can more readily take up an abstract concept that is related to it (e.g. 'seasons' and then 'climate.'

5. The topic has sufficient potential for exploration and investigation so that it can be studied for at least a week, and preferably longer. Sub-topics can be added in, and extensions of the topic can be made. For example, a project on the school bus can go on from an examination of the bus itself to include a study of other ways to transport large groups (limousines, shuttle buses, etc.) and distinctions between public and private transportation, etc. Or the children can go on from the bus study to gathering data about the bus route, how many children boarded at which stops, etc.

6. The topic will allow opportunity for problem-solving. Most projects allow for model-building (e.g. a small scale model of the neighborhood), and projects ideally should include experiments, making up questions for others to answer on the basis of the information the children conducting a particular part of the investigation have gathered. All of these parts of the project should engage children in a variety of types of problem-solving (e.g. how to build parts of the model, what materials to use, and so forth.)

7. The topic will allow opportunity for collaboration and cooperation among the children. The topic is familiar enough to some of the children that they can show initiative in exploring it, finding resources, suggesting project activities, and identifying experts who could be invited to the class to talk to them on the topic, answer the children's questions, and bring exhibits, and so forth. The fact that some of the children are very familiar with the topic means that they can help others who are less familiar to understand and to find out more about it. Aspects of the work of the project that encourages collaboration and cooperation include model-building, construction, dramatic play, making posters and graphs, creating Venn diagrams, pie charts, class books, developing interview questions and recording answers or tallies for surveys, and so forth.

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8. The topic will provide opportunity for construction, investigation and dramatic play. Dramatic play is especially important for the younger children (preschool and kindergarten). The heart of a project is finding out more about an event or phenomenon that is usually taken for granted. For example, most young children can be involved in a project on "homes" since all have a home (though some sensitivity must always be maintained about the possibility that some children might feel embarrassed about their homes). A project which looks at commonalities among homes, also their distinctions in such things like number of rooms, doors, types of windows, what floor an apartment is on, characteristics of a grandparent's nursing home, etc. helps children to examine things they normally take for granted, and that provides rich contexts for dramatic play and construction.

9. Parents can contribute to the project in some way Parents can contribute in a great variety of ways, for example as visiting experts, donors of objects to examine, assistants on field trips, helping the children investigate aspects of the topic on a weekend, etc.

10. There are good local resources related to the topic. The local community provides good possibilities for direct observation of topic-related realia, for field trips and there are experts on the topic available to come and talk to or work with the children.

11. The topic can be stated in question or narrative form. r For example, instead of calling the project "transportation" it can be defined as a study of "How we get to school," or "How houses are built" rather than simply "houses." Because young children tend to think along narrative lines, this helps give their planning, question-asking and investigations more focus, and a sense of direction.

12. Deeper knowledge of the topic will be useful in later life experiences, and is therefore worthy of further study.

Once the topic of a project is selected, the children's involvement in identifying which aspects of it to explore, in planning the work, and the kinds of reports to be prepared is

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a central feature of project work. Projects can be planned and conducted in three approximate phases following an initial period during which the teacher engaged in some brainstorming and planning by herself. The teacher may reflect her preliminary ideas in creating a web, and thing about the work that might be done and the availability of resources.

Phase I. Getting started

In the first phase of a project the teacher encourages the children to share their own personal recollections related to the topic, and review their knowledge of it, using representational and expressive competencies such as dramatic play, drawing, writing, and so forth. The teacher can learn of the special interests of individual children and their parents from the sharing of current knowledge; this sharing also helps establish a baseline of understanding for the whole group involved in the project. Parents may be able to contribute to the project in a variety of ways such as arranging places to visit, lending items for display, being interviewed by the children, and providing access to information.

Phase II. A Project in Progress

In the process of reviewing their current understanding of the topic during the first phase of a project, the children can be encouraged to raise questions on the topic. These often reveal gaps in the children's knowledge, or even misunderstandings; these can form the basis for planning the second phase of the project. In her role of consultant, the teacher is not too quick to correct misconceptions that emerge during Phase I; these can be excellent resources for learning as the children investigate and test their theories against reality.

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The main thrust of the second phase is gaining new information, especially by means of first hand, real world experience. The sources of information can be primary or secondary. Primary sources include field trips to real settings and events, such as an actual construction site, working of a machine, or the goods delivery section of a supermarket. Talking with people who have direct experience of the topic also provides first hand information.

Field work. During Phase II a field trip can be planned by the children and teacher together. Field trips do not have to be elaborate or involve expensive transportation to distant places. They can involve going to places close to the schools such as stores, parks, construction sites, or walks. With teacher aides the children can go to these sites in small groups enjoying the opportunity of having an adult to talk with about what they are observing.

The preparatory work includes identifying questions to be answered, people to talk to about their work, equipment, objects, and materials they can observe closely. Children can carry simple clip boards (made with cardboard and paper clips) and sketch objects; older children can write things of special interest that can also be used on return to the classroom. During the visit children can also be encouraged to count, note the shapes and colors of things, learn any special words for things, who does what, figure out how things work, use all their senses to deepen their knowledge of the phenomenon studied.

Back in the classroom. Upon return to the classroom the children can recall many details and represent them in increasingly elaborate ways as they learn more about the topic. The children can also use their sketches and field notes to recall observations and questions that arose during the field work. At this time the children apply skills

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already learned: talking, discussing, arguing, drawing, dramatic play writing, mathematical notation, measurement, diagrams, and so forth. If a field site is close by, such as a construction site in the vicinity of the school, it can be visited on several occasions and comparisons made between one visit and the next.

The information collected from interviews can be represented in various similar ways. The work can also be stimulated and enriched by a variety of secondary source materials, books, charts, leaflets, maps, pamphlets, and pictures. The children's work can be accumulated in individual project folders, in walls displays, group record books in which work is shared with others.

As the work progresses in phase II the children often develop a strong concern for realism and logic about the topic, and often drawing real objects becomes an increasingly absorbing activity. In their observational drawing young children can observe plants and animals closely, or see how the parts of a bicycle interconnect within the whole, note the evidence of how the pattern inside a carrot dissected different ways indicates the way water and other nutrients contribute to its growth, and so on. Interest is stimulated by frequent recognition and review of the progress being made in the development of the project.

Phase III. Concluding a project

For three and four year olds this last phase is largely taken up with dramatic play in the their project constructions. Thus, if they have built a store or a hospital they will be enacting roles associated with those settings. The main thrust of the last phase of a project for the older children is completion of the individual and group work, and to summarize what has been learned. A discussion about

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arranging ways for children to share with others their experience and what they decide they have learned from the project should be initiated before their interest in the topic wanes.

The third phase of the project can include visitors to see the work at an 'open house' or the class next door could be invited to see some of the displays of the children's work. It is also satisfying for the children to share their ideas with the principal and other interested teachers. This offers a good debriefing experience for the class following the investment of considerable effort. Preparation for such an occasion provides real purpose for a review of the work achieved. At this time the children can also be encouraged to evaluate their own work, to compare what has been found out with the questions they generated during Phase I.

It is a good idea to remember that a project could go on too long and that almost any topic can be run into the ground! We present below a brief outline of how a whole class project on a local river might proceed.

A Project About the Local River

Preliminary Teacher Planning

A project on a river very near the school might be chosen for several reasons. The study could increase the children's understanding of the river's local and regional historical as well as current importance. A number of families might have jobs related to the river. Depending on the age range of the children involved, a wide variety of sub-topics of potential value and interest to the children can be explored (for example, pollution, water safety). In preparation for the first class discussion the teacher anticipates experiences of the river the children might have had: crossing the bridges, boating, playing in a riverside park, observing nearby streams, and so forth. She may also create a web by herself, and then with the children to gain

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some preliminary ideas about the scope and sub-topics the project might include.

**[Insert About Here:
Planning Web of River Project]**

Phase I. The children's knowledge and experience of the river. (Approximately a week)

During an initial discussion the children and teacher share stories of their experiences of the topic. Children are encouraged to draw or paint their impression of the river and what happens there. The teacher could suggest dramatic play and block construction opportunities for the children to represent their experiences to each other. The teacher can read river stories and poems to the class, and ask those children able to do so to write about events in their experience. One child might write about a picnic in the park, others about feeding ducks, a boat ride, a fishing trip, and so forth. These stories would be shared through wall displays, discussion or dramatic play. Assessment of the children's experience and current levels of understanding about the river would give rise to questions that would structure the opening activities in Phase II of the project. For example, Which way does the river flow? Where does the water come from and go to? What wildlife can be found living on, in and near the river? What kinds of plants grow in or near the water? Whose work is concerned with the river? and so forth.

Phase II. Finding out about the river (Approximately three weeks)

Field work can take a variety of forms, depending on the proximity and accessibility of the river to the school. If the river has a shallow bank and is close by, the children could return there several times for specific purposes, for

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example, to look for evidence of animals (e.g. tracks), observe the river's flow and measure fluctuations in depth or speed, identify birds or animals, collect water and soil samples, survey the kind of garbage washed up on the bank, and so forth. People whose work concerns the town's main water supply, water treatment, a local bird sanctuary or farming near the river could be invited to talk to the children on the site or in the classroom, and be interviewed by them. Letters could be written by the children to invite and subsequently thank such visitors or to collect information from a variety of sources.

Discussion of the field experiences would be followed up in dramatic play, construction activities (bridges, boats, etc.), scientific and environmental investigations (analyzing the water with filtering procedures, floating and sinking, experimenting with variations in the speed of flow at different depths and widths of channels, simulating flooding with a model landscape), observing small creatures in an aquarium or a vivarium, counting sets of objects collected or observed during survey work (garbage: cans, glass, paper, plastic), or plants: different grasses, or flowers within a given area, or people observed: fishing, canoeing, picnicking) and comparing and measuring depth, height or distance by nonstandard measures.

Depending on the age range and competences of the children, during Phase II they can produce tape recordings, videotapes, photos, writing (letters, descriptions, reports, stories, etc.) drawing from direct observation, painting, model constructions, and bar graphs or other frequency charts (Venn diagrams, pie chats, etc.). The children could make simple books about various subtopics they have developed special interest in. The teacher would record the main events in the life of the project by means of photographs, anecdotal records and tape recordings. These make an interesting story

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to share with parents concerning the work their children have been involved in. The work products themselves can serve as sources of information or ideas and techniques to try for themselves. They should therefore be displayed for a time in the classroom on tables, shelves or bulletin boards within easy reach of the children. Selected pieces of children's work, attractively mounted and displayed, would help the teacher to provide models for standards of work she wishes to encourage, including standards of originality, sustained effort, problems solving and presentation of information. These displays would also provide evidence of the progression of the children's' learning throughout the project. Secondary sources of information, books, charts, maps,and informative pamphlets would be collected and displayed for the teacher and children to refer to in their work.

Phase III. Concluding the project on the river. (one week)

A culminating event would be arranged in the form an 'open house' for parents. The displays might be organized around the classroom in the sequence telling the story of the river, from its source to its eventual destination in the ocean. These might include descriptions of the filtering procedures the children used to analyze muddy flood water and to purify it, reports of the visits to the river at different times, or to the water treatment plant, and accounts of conversations with experts. Photographs, drawings and painting can be used to illustrate the written accounts. The children could help to prepare snacks, sing a song or two, read or tell stories of their experiences, act out a short skit to demonstrate a procedure they have learned about, etc. In preparation for a simple sharing event such as this the children can review and evaluate what they have learned and can formulate new questions for future study. For example, What if the river were diverted or dammed? What if it didn't rain for a year? What different kinds of bridges

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might be designed to span the river when the old ones need rebuilding? Such questions as these lead to thoughts about wider issues of conservation, climate, technology, and historical change.

Summary of the river project

The example of a project on a river outlined above shows just a small sample of the possible discussions and investigations that might arise. The time scale suggested is very tentative and might be longer or shorter depending on the intentions of the teacher, the ages of the children, their interests, and other plans for the class at that time. Different teachers might approach the same topic emphasizing different aspects of it; the important thing is that each child in the group can find an area of interest to pursue, something to construct, to draw, to write about and is able to share that interest with the rest of the class. Some children can try out skills and ideas for themselves on the topic of water purification, others on wildlife in or at the river, some river sports and how boats work, and still others on the work that people do to preserve the natural environment and promote safety near the river. All the children would have had talking, writing, drawing, construction, investigation, counting and measuring, etc.,etc. even though they may not each have been involved with the same information content. But the teacher can ensure that a small set of basic concepts necessary for understanding what rivers are, how they differ from other bodies of water, and what they mean to human beings have been learned by all the children in the class.

Summary

One of the principal aims for all projects is that children have opportunity to use a variety of skills and concepts and to learn about something of personal interest to

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them. In this way, project work is intrinsically motivating for children.

For preschool children, project work is the more formal and teacher directed part of the curriculum, since much of the curriculum is devoted to opportunity for spontaneous play. However, at the upper end of the elementary age range, project work is the less formal part of the curriculum, since other parts involve children in systematic instruction and practice in basic skills and academic disciplines. In the latter case, project work provides a greater sense of self direction and personal involvement in school learning than other aspects of the curriculum.

The project approach also offers opportunities for children and parents to work closely together in support of the school program. It also enables children to try out their ideas in a safe context where making mistakes can be seen constructively as opportunities for learning by both children and teacher. It builds self-confidence and encourages creativity and other dispositions that should serve the children all their lives.

The inclusion of project work in the curriculum for young children addresses the four major learning goals of all education: the construction and acquisition of worthwhile knowledge, the
development of a wide variety of basic intellectual and social skills, strengthening desirable dispositions and engendering positive feelings about themselves as learners and participants in group endeavors. Because project work is complementary to formal instruction, children have opportunity to apply their basic skills in the course of studying meaningful topics. In this way, school experience becomes interesting not only to the children, but to the teacher as well.

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